

ABSTRACT

FEATURE SIZE REDUCTION IN THIN FILM MAGNETIC WRITE HEAD USING LOW TEMPERATURE DEPOSITION COATING OF PHOTOLITHOGRAPHICALLY- DEFINED TRENCHES

5 A method for reducing feature size in a thin film magnetic write head using low
temperature deposition coating of photolithographically-defined trenches. According to the
method, a plating seed layer is applied over a selected base layer and a photoresist layer is
spun onto the seed layer to a desired thickness. A trench is defined in the photoresist layer to
initiate the formation of a stencil for the pole piece. The trench is deep enough to expose the
10 plating seed layer, and has substantially vertical side walls. An insulative spacer layer is
deposited to cover the trench side walls using a low temperature chemical vapor deposition
process. Horizontal portions of the spacer layer are anisotropically etched to remove spacer
layer material from the bottom of the trench and thereby expose the plating seed layer, while
leaving intact vertical portions of the spacer layer that cover the trench side walls. This
15 process defines a narrowed trench that is reduced in horizontal size according to
approximately twice the thickness of the spacer layer on the trench side walls. A structure of
reduced feature size is formed by electroplating metallic material into the narrowed trench.
The photoresist layer and the spacer layer vertical portions are then stripped away, and the
plating seed layer is milled or sputter etched to leave a structure of reduced feature size.